art - Support #25394

Build Art with CLHEP 2.4.4.0

01/13/2021 12:52 PM - Julia Yarba

Status:	Closed	**Start date:**	01/13/2021
Priority:	Normal	**Due date:**	
Assignee:	Christopher Green	**% Done:**	100%
Category:	Release	**Estimated time:**	0.00 hour
Target version:	3.08.00	**Spent time:**	0.00 hour
Scope:		**SSI Package:**	
Experiment:			

Description

Now that Geant4 version 10.7 (latests public release) requires CLHEP 2.4.4.0 would it be possible to build Art with this version of CLHEP ?

History

#1 - 01/13/2021 01:57 PM - Lynn Garren

Julia, are you able to build 10.7 with the older CLHEP? Please help us understand the urgency of this request.

#2 - 01/13/2021 03:08 PM - Julia Yarba

Hello Lynn, all,
Yes, I'm able to build Geant4 10.7 with CLHEP 2.4.1.3a although it requires a (local) patch.
However, CLHEP 2.4.4.0 features updates to a number of physics constants, thus it's likely to be of interest to the users community.
Here is from the change log: ==========
09.11.20 Release CLHEP-2.4.4.0 ==========

14 July 2020 - K.Savvidis, G.Cosmo

- Random: Use 32-bit internal seeds types coherently in MixMaxRng.
  Addressing CLHEP JIRA ticket #156.

2020-07-20 Gabriele Cosmo <Gabriele.Cosmo@cern.ch>

- Units: Updated values in SystemOfUnits.h and PhysicalConstants.h for:
  e_SI, electron charge
  h_Planck, Planck constant
  Avogadro, Avogadro constant
  k_Boltzmann, Boltzmann constant
  based on May 2019 redefinition of SI units. References:
  https://en.wikipedia.org/wiki/2019_redefinition_of_the_SI_base_units
  https://www.britannica.com/science/electron-charge.

#3 - 01/13/2021 03:16 PM - Krzysztof Genser

Please note that the CLHEP JIRA ticket #156 addressed a segfault in the MixMax engine when setting seeds using more than 2 of its elements and that may impact experiments using this engine once a need to use all four seed elements comes up.

#4 - 01/13/2021 03:20 PM - Lynn Garren

Thank you for the information. I note that a couple more small fixes have recently gone into CLHEP. There will likely be a 2.4.4.1 release soon, which should also be suitable.

#5 - 01/19/2021 10:03 AM - Lynn Garren

LArSoft is currently using geant4 v4_10_6_p01. NOvA is, I believe, using v4_10_4_p02d. We need to ensure that it is possible to build these older releases of geant4 with clhep 2.4.4.0 and 2.4.4.1. Note that if there are no problems building with 2.4.4.0, I do not anticipate any problems building with 2.4.4.1. Would the geant team please test?

#6 - 01/19/2021 01:15 PM - Kyle Knoepfel

- Status changed from New to Feedback

#7 - 01/19/2021 05:00 PM - Lynn Garren

- Scope deleted (Internal)

- Experiment deleted (-)

clhep v2_4_4_1 is now available. Note that LArSoft will be using geant4 v4_10_6_p01c soon when it upgrades to art 3.06.03.

#8 - 01/21/2021 05:51 PM - Julia Yarba

In a quick try, Geant4 10.6.p01, 10.6.p02, and 10.4.p02 all build fine against clhep v2_4_4_1 (at least if using gcc 9.3.0 compiler and specifying c++17 standard). We are also checking with relevant Geant4 experts if any objections/obstacles can be anticipated when using clhep 2.4.4.x-series with earlier Geant4 releases.

#9 - 01/22/2021 11:17 AM - Julia Yarba

With the above said, the Geant4 experts state that minor releases of CLHEP are always backward compatible. This means that e.g. Geant4.10.7 should be safe with e.g. CLHEP 2.4.4.1 (required is 2.4.4.0). However, as a general rule, Geant4 is not guaranteed to work with CLHEP release that's notably different from the recommended one. Again, based on our so far experience, Geant4 10.6.p01/p02 or even 10.4.p02 do build with the latest CLHEP 2.4.4.1. However, we can not attest how every particular application based on such build(s) may behave.

#10 - 01/22/2021 01:03 PM - Lynn Garren

- Assignee set to Christopher Green

- Status changed from Feedback to Assigned

Thanks Julia. We understand. Our experience has been that different CLHEP releases *usually* work.

#11 - 01/26/2021 02:37 PM - Lynn Garren

I've tagged geant4 v4_10_6_p02c (mu2e) and geant4 v4_10_6_p01d (larsoft) with clhep v2_4_4_1. Source code tarballs are available on SciSoft. The SciSoft team is in the process of providing an art release with clhep v2_4_4_1, and will update this ticket when that is complete.

#12 - 03/01/2021 10:20 AM - Kyle Knoepfel

- % Done changed from 0 to 100

- Status changed from Assigned to Resolved

#13 - 03/09/2021 02:38 PM - Kyle Knoepfel

- Target version set to 3.08.00

- Status changed from Resolved to Closed

- Category set to Release

art 3.08.00 depends on CLHEP 2.4.4.1.